

WHAT IS CLAIMED IS

1. An electrical neuromuscular stimulator for measuring muscle reactions generated by electrical stimulation pulses, including an electrical pulse generator arranged in a case of the stimulator, at least one pair of stimulation electrodes intended to be placed on an user's skin on the motor points of the muscles to be stimulated, each electrode being connected to one end of an electric cable, the other end of which is connected to the case to receive the electric pulses from the generator, at least one sensor sensitive to the muscle reactions caused by the electric stimulation signals and arranged for transmitting electric measuring signals representative of said muscle reactions to electronic means in the stimulator case,

5 10 wherein the sensor is mechanically connected to one of the electrodes or to the end of one of the cables on the electrode side, and wherein at least one conductor wire per electric cable connects the respective electrode independently of the sensor.

15 2. A stimulator according to claim 1, wherein each end of the electric cables on the electrode side is securely fixed to the respective electrode structure.

3. A stimulator according to claim 1, wherein each cable end on the electrode side has a connector connected to the respective electrode structure by removable fixing means.

20 4. A stimulator according to claim 3, wherein the removable fixing means are of the snap fastening type also acting as electric contact between the connector and at least one active conducting surface of the respective electrode.

25 5. A stimulator according to claim 3, wherein the removable fixing means, acting also as electric contact between the connector and at least two active surfaces of the electrode, include at least two conductive studs inserted with a certain mechanical resistance in two conductive pots, the studs forming part of the electrode structure and the pots forming part of the connector, or vice versa.

30 6. A stimulator according to claim 1, wherein the measuring sensor is an electromyographical sensor having at least one active conductive surface placed without electric contact beside at least one other active conductive surface of the electrode receiving the electric pulses, said active surfaces being placed on the motor points of the muscles to be stimulated.

7. A stimulator according to claim 1, wherein the sensor is an acceleration meter or a microphone integrated in the connector of the end of the cable on the electrode side or in the structure of one of the respective electrodes.

8. A stimulator according to one of claims 6 and 7, wherein the means for processing the signals received from the sensor are integrated in the connector or in the electrode structure.

9. A stimulator according to claim 1, wherein the sensor is in

5 communication with the electronic means of the stimulator via wireless signal transmitting and/or receiving means housed in the cable connector or in the electrode structure, or via at least one conductor wire of the cable other than that of the electrode.

10. A stimulator according to claim 9, wherein an electric power source is

10 housed in the connector or in the electrode structure for supplying power to the electronic components for measuring muscle reactions.

11. A stimulator according to claim 1, wherein it includes, on the case, a visual display device capable of displaying in particular electric stimulation programmes and data relating to the electric muscle reaction measuring signals.

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12. An electric cable for a stimulator according to claim 1, wherein one end of the cable on the electrode side has a connector for connection to the structure of a stimulation electrode via removable fixing means also acting as electric contact for the active surface or surfaces of the electrode, wherein the connector includes at least a

20 part of a sensor sensitive to muscle reactions, and wherein it includes in an insulating sheath at least one conductor wire for connecting the active surface or surfaces of the stimulation electrode independently of the sensor.

13. An electric cable according to claim 12, wherein the connector encloses processing means for the signals supplied by the sensor.

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14. An electric cable according to claim 12, wherein the means for fixing to the electrode are of the snap fastening type or of the multicontact type.

15. An electric cable according to claim 12, wherein the connector includes wireless signal transmitting and/or receiving means, and an electric power source for the electronic components for measuring the muscle reactions.

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16. A stimulation electrode for a stimulator according to claim 1, wherein it includes at least one active conductive surface for receiving the electric pulses, and wherein the active surface is electrically connected to removable means for fixing to a cable connector.

17. A stimulation electrode according to claim 16, wherein it includes an

35 electromyographical sensor having at least one other active conductive surface arranged without electric contact beside the active surface receiving the electric pulses, or an acceleration meter or a microphone placed on the electrode structure.

18. A stimulation electrode according to claim 16, wherein its structure is flexible so as to be able to match the shape onto which it is placed, and wherein a portion of its structure, surrounding the active surface or surfaces in the form of a metal wire, is coated or covered with a self-adhesive material or film so as to be able
5 to stay on the skin without using additional holding elements.

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